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Remarks:

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(54) **Load sharing method, device, and system**

(57) A load sharing method, device, and system are provided in embodiments of the present invention. A method includes: obtaining a current load value; if the current load value exceeds a preset load threshold value, interacting with middle base stations in an MME of a requesting base station through load state signaling, and selecting a sharing base station; transmitting information of a shared load that needs to be balanced to the selected sharing base station; and balancing the shared load, by the sharing base station, according to baseband resource prepared based on information of the shared load. In the embodiments of the present invention, if the requesting base station detects that the load is heavy, the requesting base station selects a sharing base station from the base station pool configured in the same MME, and balances the load to be balanced to the sharing base station.

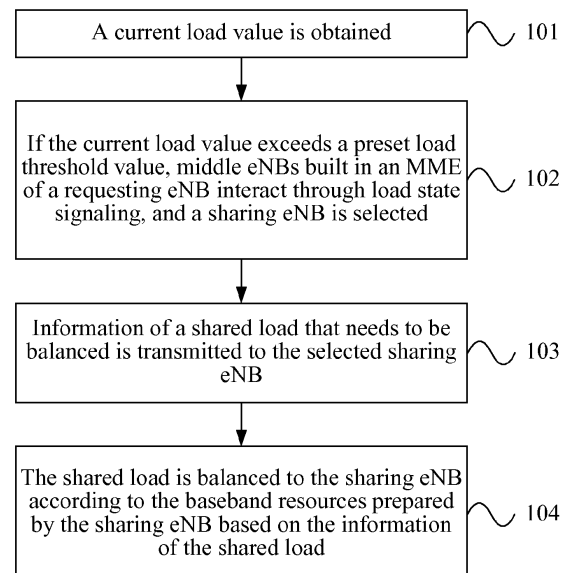


FIG. 1

Description**FIELD OF THE INVENTION**

5 **[0001]** The present invention relates to the field of communication technologies, and in particular, to a load sharing method, device and system.

BACKGROUND

10 **[0002]** Evolved universal mobile telecommunication system (universal mobile telecommunication system, UMTS for short) territorial radio Access network (evolved universal mobile telecommunication system territorial radio access network, E-UTRAN for short) and evolved packet core (evolved packet core, EPC for short) form evolved packet system (evolved packet system, EPS for short). The E-UTRAN includes a base station (Evolved Node B, eNB for short). On the EPS with flat system architecture, the load status between eNBs can be communicated by exchanging signaling through interconnected X2 interfaces. Each eNB serves a separate cell. Each eNB is connected to mobility management entity (mobility management entity, MME for short) in the EPC through S1 interface.

15 **[0003]** When implementing the present invention, the inventor finds at least the following defects of the existing technology: In the preceding system, in different time periods, the traffic volume of the cells served by each eNB is different. An eNB to which a cell with a light traffic volume belongs has a light load. An eNB to which a cell with a heavy traffic volume belongs has a heavy load. As a result, the load on eNBs is unbalanced, thereby lightening the usage rate of radio baseband resource.

SUMMARY

25 **[0004]** A load sharing method, device and system are provided in embodiments of the present invention.

[0005] A load sharing method is provided in an embodiment of the present invention. The load sharing method includes:

obtaining a current load value;

if the current load value exceeds a preset load threshold value, interacting with middle eNBs built in an MME of a requesting eNB through load state signaling, and selecting a sharing eNB;

transmitting information of a shared load that needs to be balanced to the selected sharing eNB; and

sharing the shared load to the sharing eNB according to baseband resource prepared based on information of the shared load.

35 **[0006]** Another load sharing method is provided in an embodiment of the present invention. The load sharing method includes:

when a current load value of a requesting eNB exceeds a preset load threshold value, receiving information of a shared load that needs to be balanced sent by the requesting eNB; and

40 preparing baseband resource based on the information of the shared load for the requesting eNB to balance the shared load to a sharing eNB.

[0007] A load sharing device is provided in an embodiment of the present invention. The device includes:

45 a first obtaining unit, configured to obtain a current load value;

a selecting unit, configured to: if the current load value exceeds a preset load threshold value, interact with middle eNBs built in an MME of a requesting eNB through load state signaling, and select a sharing eNB;

a processing unit, configured to transmit information of a shared load that needs to be balanced to the selected sharing eNB; and

50 a sharing unit, configured to balance the shared load to the sharing eNB according to baseband resource prepared based on information of the shared load.

[0008] Another load sharing device is provided in an embodiment of the present invention. The device includes:

55 a second obtaining unit, configured to: when a current load value of a requesting eNB exceeds a preset load threshold value, receive information of a shared load that needs to be balanced sent by the requesting eNB; and

a preparing unit, configured to prepare baseband resource based on the information of the shared load for the requesting eNB to balance the shared load to a sharing eNB.

[0009] A load sharing system is provided in an embodiment of the present invention. The system includes a requesting eNB and a sharing eNB, wherein:

the requesting eNB is configured to: obtain a current load value; if the current load value exceeds a preset load threshold value, interact with middle eNBs built in an MME of the requesting eNB through load state signaling, and select the sharing eNB; transmit information of a shared load that needs to be balanced to the selected sharing eNB; and balance the shared load to the sharing eNB according to baseband resource prepared based on information of the shared load; and

the sharing eNB is configured to obtain the information of the shared load that needs to be balanced sent by the requesting eNB and prepare baseband resource based on the information of the shared load.

[0010] It can be understood from the preceding technical scheme that when the requesting eNB in the embodiment of the present invention detects an excessively heavy load, a sharing eNB is selected from the middle eNBs configured in the same MME to share the load to be balanced. A terminal that shares services can use the radio frequency resource of a heavy-load eNB, that is, the requesting eNB, and uses the baseband resource of other light-load eNB, that is, the sharing eNB, thereby balancing the load among eNBs, improving the usage rate of radio baseband resource, fully using different devices of the operator, and saving the cost.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] To better illustrate technical solutions in embodiments of the present invention or in the prior art, the drawings that need to be used in embodiments of the present invention or the description of existing technologies are introduced briefly. Obviously, the drawings merely reflect some embodiments of the present invention. Those skilled in the art can obtain other drawings based on these drawings without innovative work.

FIG. 1 shows a process of a load sharing method provided in a first embodiment of the present invention;
 FIG. 2 shows a process of a load sharing method provided in a second embodiment of the present invention;
 FIG. 3 shows a process of a load sharing method provided in a third embodiment of the present invention;
 FIG. 4 shows a structure of a load sharing device provided in a fourth embodiment of the present invention;
 FIG. 5 shows a structure of a load sharing device provided in a fifth embodiment of the present invention; and
 FIG. 6 shows a structure of a load sharing system provided in a sixth embodiment of the present invention.

DETAILED DESCRIPTION

[0012] The technical solution under the present invention is elaborated below with reference to the accompanying drawings. Evidently, the embodiments described below are for the exemplary purpose only, without covering all embodiments of the present invention. All the other embodiments obtained by those skilled in the art without creative work based on the embodiments of the present invention are protected by the present invention.

[0013] FIG. 1 shows a process of a load sharing method provided in a first embodiment of the present invention. The load sharing method in this embodiment may include:

Step 101: obtaining a current load value.

Step 102: if the current load value exceeds a preset load threshold value, interacting with middle eNBs built in an MME of a requesting eNB through load state signaling, and selecting a sharing eNB.

Step 103: transmitting information of a shared load that needs to be balanced to the selected sharing eNB.

Step 104: sharing the shared load to the sharing eNB according to baseband resource prepared based on the information of the shared load.

[0014] The load threshold value in this embodiment is the load threshold value for the requesting eNB to ensure quality of service (quality of service, QoS for short) for UE. If the current load value is smaller than this load threshold value, the requesting eNB can ensure the QoS for an accessed UE. If the current load value is greater than this load threshold value, the requesting eNB cannot ensure the QoS for an accessed UE.

[0015] The load sharing method provided in this embodiment of the present invention may use two modes for sharing the services of UE. In one mode, the requesting eNB shares all services of one or more UEs to the sharing eNB. In another mode, the requesting eNB shares some services of one or more UEs to the sharing eNB. For the first mode, the information of the shared load in this embodiment may include UE information such as the context information of the UE for load sharing and ID (AP ID) of the UE in the MME. For the second mode, the information of the shared load in this embodiment further includes service information such as service ID in load sharing.

[0016] In this embodiment, the overloaded requesting eNB can balance the load to be balanced to one or more sharing eNBs configured in the homing MME so that UEs can use the radio resource of the heavy-load eNB and use the baseband resource of other light-load eNBs to ensure the QoS, thereby properly using baseband resource sharing of light-load eNBs, balancing the eNB load, and improving the usage rate of radio baseband resource.

[0017] FIG. 2 shows a process of a load sharing method in a second embodiment of the present invention. The load sharing method in this embodiment may include:

Step 201: when a current load value of a requesting eNB exceeds a preset load threshold value, receiving information of a shared load that needs to be balanced sent by a requesting eNB; and

Step 202: preparing baseband resource based on the information of the shared load for the requesting eNB to share the shared load to a sharing eNB.

[0018] The load sharing method provided in this embodiment of the present invention may use two modes for sharing the services of UE. In one mode, the requesting eNB balances all services of one or more UEs to the sharing eNB. In another mode, the requesting eNB balances some services of one or more UEs to the sharing eNB. For the first mode, the information of the shared load in this embodiment may include UE information such as the context information of the UE for load sharing and ID (AP ID) of the UE in the MME. For the second mode, the information of the shared load in this embodiment further includes service information such as service ID in load sharing. The sharing eNB can prepare relevant baseband resource for the corresponding shared load between eNB and MME based on the information of the shared load, and use the relevant baseband resource for the corresponding shared load to receive load-sharing data from the EPC. In this manner, after relevant processing of the load-sharing data, the requesting eNB can deliver the load-sharing data to relevant UEs. As a result, the requesting eNB with an excessively heavy load currently can balance the load to the sharing eNB with a light load.

[0019] In this embodiment, the overloaded requesting eNB can balance the load to be balanced to one sharing eNB configured in the homing MME so that UEs can use radio resource of the heavy-load eNB and use the baseband resource of other light-load eNBs to ensure the QoS, thereby properly using baseband resource sharing of light-load eNBs, balancing the eNB load, and improving the usage rate of radio baseband resource.

[0020] FIG. 3 shows a process of a load sharing method in a third embodiment of the present invention. The load sharing method in this embodiment may include:

Step 301: obtaining, by a requesting eNB, a current load value of the requesting eNB.

Step 302: if the current load value of the requesting eNB is greater than a preset load threshold value, sending, by the requesting eNB, a resource status request message (resource status request) to all middle eNBs configured in a homing MME of the requesting eNB, wherein the resource status request message carries a shared load value (load threshold) that specifies the load to be balanced.

[0021] In this embodiment, all middle eNBs in a same MME that can be interconnected through the X2 interface can be configured into an eNB pool (eNB pool), and a relevant eNB pool ID (eNB pool ID) is allocated to this eNB pool. The middle eNBs in the eNB pool are independent. The configuration of the eNB pool is simple. The subsequent networking mode is flexible, and capacity expansion is convenient.

[0022] Different policies may be used to determine the shared load value. For example, the excessive load value may be defined as the expected shared load value. Relevant information, such as service type and service quality, of the current service may be used to define the shared load value. The shared load value determined through the preceding policies defines the load to be balanced.

[0023] Further, this resource status request message may contain relevant information of the eNB pool, for example, eNB pool ID, relevant information of the operator to which the relevant middle eNB belongs, for example, operator ID, and relevant service information, for example, service license ID. Table 1 lists the IEs contained in the resource status request message.

Table 1 IEs contained in the resource status request message

IE Name	Mandatory or Not	Status in the Protocol
Message Type	Mandatory (M)	Existing
Registration Request	Mandatory (M)	Existing
Cell To Report List		Existing
>Cell ID	Mandatory (M)	Existing

(continued)

IE Name	Mandatory or Not	Status in the Protocol
Reporting Periodicity	Optional (O)	Existing
Load To Report List	Mandatory (M)	Newly added
>eNodeB Pool ID	Mandatory (M)	Newly added
>Load Threshold	Mandatory (M)	Newly added
>Operator ID	Mandatory (M)	Newly added

[0024] Compared with the current signaling, the resource status request message in this step adds the load to report list IE. This IE is mandatory in the step in this embodiment of the present invention. The cell to report and reporting periodicity IEs are optional. The load threshold IE is the shared load expected by the requesting eNB for other middle eNBs in the same eNB pool to share.

[0025] Step 303: receiving, by the middle eNBs configured in the MME, the resource status request message, and returning a resource status response message to the requesting eNB based on the value of load threshold and the current load value of each middle eNB, where the resource status response message carries a load information IE that specifies the current load information corresponding to the middle eNB.

[0026] After receiving the resource status request message, the middle eNB in the homing MME of the requesting eNB can determine value of the load of the requesting eNB that can be shared by the middle eNB based on the obtained current load value, and compare the determined value with the value of the load that needs to be balanced contained in the resource status request message. If the value of the load that can be shared is greater than the value of the load that needs to be balanced, the middle eNB returns a resource status response message to the requesting eNB. Further, each middle eNB can determine the value of the load that it can share based on service license (license) it can provide. Accordingly, the resource status response message may contain license ability (license ability). Table 2 lists the IEs contained in the resource status response message.

Table 2 IEs contained in the resource status response message

IE Name	Mandatory or Not	Status in the Protocol
Message Type	Mandatory (M)	Existing
Criticality Diagnostics	Mandatory (M)	Existing
Load Report List	Mandatory (M)	Newly added
Operator ID	Mandatory (M)	Newly added
Licenses Ability	Mandatory (M)	Newly added
Load Information	Mandatory (M)	Newly added

[0027] Compared with the existing signaling, the resource status response message in this step adds the load to report list IE, which is mandatory in this step.

[0028] Step 304: receiving, by the requesting eNB, resource status response messages from one or more middle eNBs, and selecting a proper middle eNB as a sharing eNB according to the current load value of the middle eNB and the license type in the resource status response messages, for example, selecting the middle eNB with the smallest current load value as the sharing eNB.

[0029] Step 305: sending, by the requesting eNB, a resource reassign request message (resource reassign request) to the selected sharing eNB, where the resource reassign request message carries information of the load to be balanced, for the sharing eNB to prepare baseband resource corresponding to the load to be balanced.

[0030] The load sharing method provided in this embodiment of the present invention may use two modes for sharing the services of UE. In one mode, the requesting eNB balances all services of one or more UEs to the sharing eNB. In another mode, the requesting eNB shares some services of one or more UEs to the sharing eNB. For the first mode, the information of the shared load in this embodiment may include UE information such as the context information of the UE for load sharing and ID (AP ID) of the UE in the MME. For the second mode, the information of the shared load in this embodiment further includes service information such as the service ID in load sharing.

[0031] Step 306: receiving, by the sharing eNB, the resource reassign request message, and performing baseband resource admission for the shared load requested in the resource reassign request message.

[0032] Step 307: after baseband resource admission succeeds, sending, by the sharing eNB, a path switch request (path switch request) message for establishing user plane data for relevant user load, where the message carries information of the load to be balanced to request for sharing the relevant load.

[0033] Step 308: after receiving the path switch request message and interacting with a service gateway (S-GW) to obtain a response from the S-GW, sending, by the MME, a path switch request ack (path switch request ack) message to the sharing eNB to complete interaction between the sharing eNB and the MME at the signaling plane and data plane.

[0034] Step 309: receiving, by the sharing eNB, the path switch request ack message, and returns a resource reassign response (resource reassign response) message to the requesting eNB.

[0035] For details about the Resource Reassign Request message in step 305, reference may be made to handover request (handover request) message in the 3GPP 36.323 X2AP protocol. For details about the Resource Reassign Response message in step 309, reference may be made to handover request ack (handover request ack) message in the 3GPP 36.323 X2AP protocol.

[0036] After receiving the Resource Reassign Response message, the requesting eNB releases the baseband resource related to the shared UE. By far, the requesting eNB receives the resource reassign response message and confirms that load sharing is implemented at the signaling layer.

[0037] Step 310: interacting, by the sharing eNB, with the MME and the requesting eNB, and the requesting eNB shares the load to be balanced to the sharing eNB.

[0038] By far, the downlink data delivered by the core network to the UE that shares the load is transmitted to the sharing eNB. The sharing eNB transmits the data to the UE by using remote radio unit (remote radio unit, RRU for short) of the requesting eNB through the CPRI interface between the sharing eNB and the requesting eNB. The uplink data is transmitted in the opposite direction.

[0039] In this embodiment of the present invention, the load state between eNBs is known through interaction of the load state signaling at the X2 interfaces of the eNBs. When the load of a certain eNB is unbalanced, a light-load eNB sends a load sharing request to switch the load service of the UE from one eNB to another eNB, thereby balancing the load between eNBs. Signaling interaction between eNBs is implemented by adding relevant IEs to existing signaling and using the path switch signaling group interacted with the core network during switching.

[0040] In this embodiment, the requesting eNB and middle eNBs (including the sharing eNB) are neighboring and belong to the same MME, but serve different cells. In different time periods, the traffic volume of a cell served by an eNB is different. For example, the cell served by the requesting eNB is in the city center, where the traffic volume at daytime is heavy. As a result, the load of the requesting eNB is heavy. The cell served by a middle eNB is in the residence area, where the traffic volume at daytime is light. As a result, the load of the middle eNB is light. In this case, the usage of resource among eNBs is unbalanced. The method provided in this embodiment can balance the load by scheduling neighboring sharing eNBs whose load is light when the requesting eNB has a heavy load. In this embodiment, when the load of the requesting eNB is heavy, a sharing eNB can be selected through interaction of the load state signaling with the middle eNBs configured in the same MME. The sharing eNB interacts with the MME in the EPC. The relevant baseband resource of the shared load between the sharing eNB and the MME are used to receive the load-sharing data delivered by the EPC. After relevant processing on the load-sharing data, the sharing eNB interacts with the requesting eNB, and delivers the load-sharing data through the requesting eNB to the relevant UE. In this case, some services, that is, the shared load, of the requesting eNB currently with a heavy load can be processed by the sharing eNB with a light load, thereby implementing switching of services between eNBs.

[0041] When the UE does not meet the switching conditions, the eNBs interact signaling through the X2 interface to share the load among eNBs in flexible modes. The shared load can be switched dynamically between eNBs, thereby properly using the baseband resource of the eNB. The UE whose load is shared uses the radio frequency resource of the homing eNB of the accessed cell, that is, the requesting eNB, and the baseband resource of the sharing eNB, thereby balancing the load between the requesting eNB and the destination eNB, reducing the load of the requesting eNB, improving the usage rate of radio baseband resource, and ensuring the QoS for the UE.

[0042] In this embodiment, the X2 interface is used to interact signaling for load query and load sharing on the EPS network, and the CPRI interface between eNBs may be used to transmit load data. In this case, in the eNB pool configured in the MME, the requesting eNB with a heavy load can share the load to be balanced to a sharing eNB configured in the same MME, enabling the UE to use the radio frequency resource of a heavy-load eNB and baseband resource of other light-load eNBs, thereby implementing baseband resource sharing among eNBs, balancing the load among eNBs, and improving the usage rate of radio baseband resource.

[0043] FIG. 4 shows a structure of a load sharing device provided in a fourth embodiment of the present invention. The load sharing device in this embodiment may include a first obtaining unit 41, a selecting unit 42, a processing unit 43, and a sharing unit 44. The first obtaining unit 41 obtains a current load value. If the current load value exceeds a preset load threshold value, the selecting unit 42 interacts through load state signaling with middle eNBs configured in an MME to which the requesting eNB belongs, and selects a sharing eNB. The processing unit 43 transmits information of a shared load that needs to be balanced to the selected sharing eNB. The sharing unit 44 balances the shared load

to the sharing eNB according to the baseband resource prepared by the sharing eNB based on the information of the shared load.

[0044] The method in the first embodiment of the present invention and the function of the requesting eNB in the third embodiment may be implemented by the load-sharing device provided in the fourth embodiment of the present invention.

[0045] The sharing unit in the load sharing device provided in this embodiment of the present invention may use two modes for sharing the services of UE. In one mode, the sharing unit balances all services of one or more UEs to the sharing eNB. In another mode, the sharing unit shares some services of one or more UEs to the sharing eNB. For the first mode, the information of the shared load in this embodiment may include UE information such as the context information of the UE for load sharing and ID (AP ID) of the UE in the MME. For the second mode, the information of the shared load in this embodiment further includes service information such as the service ID in load sharing.

[0046] In this embodiment, the overloaded requesting eNB can balance the load to be balanced to one sharing eNB configured in the homing MME so that UEs can use the radio resource of the heavy-load eNB and use the baseband resource of other light-load eNBs, thereby properly using baseband resource sharing of light-load eNBs, balancing the eNB load, and improving the usage rate of radio baseband resource.

[0047] FIG. 5 shows a structure of a load sharing device provided in a fifth embodiment of the present invention. The load sharing device in this embodiment may include a second obtaining unit 51 and a preparing unit 52. When the current load value of a requesting eNB exceeds a preset load threshold value, the second obtaining unit 51 receives information of a shared load to be balanced sent by the requesting eNB, and the preparing unit 52 prepares baseband resource based on the information of the shared load for the requesting eNB to balance the shared load to a sharing eNB.

[0048] The method in the second embodiment of the present invention and the function of the sharing eNB in the third embodiment may be implemented by the load-sharing device provided in the fifth embodiment of the present invention.

[0049] The preparing unit in the load sharing device provided in this embodiment of the present invention can prepare relevant baseband resource for the corresponding shared load between eNB and MME based on the information of the shared load, and use the relevant baseband resource for the corresponding shared load to receive load-sharing data from the EPC. In this manner, after relevant processing of the load-sharing data, the requesting eNB can deliver the load-sharing data to relevant UEs. As a result, the requesting eNB with an excessively heavy load currently can balance the load to the sharing eNB with a light load.

[0050] In this embodiment, the overloaded requesting eNB can balance the load to be balanced to one sharing eNB configured in the homing MME so that UEs can use the radio resource of the heavy-load eNB and use the baseband resource of other light-load eNBs, thereby properly using baseband resource sharing of light-load eNBs, balancing the eNB load, and improving the usage rate of radio baseband resource.

[0051] FIG. 6 shows a structure of a load sharing system provided in a sixth embodiment of the present invention. The load sharing system provided in this embodiment may include a requesting eNB 61 and a sharing eNB 62, where:

the requesting eNB 61 is configured to: obtain a current load value; if the current load value exceeds a preset load threshold value, interact with middle eNBs built in an MME of the requesting eNB 61 through load state signaling, and select the sharing eNB 62; transmit information of a shared load that needs to be balanced to the selected sharing eNB 62; and balance the shared load to the sharing eNB 62 according to baseband resource prepared based on information of the shared load; and

the sharing eNB 62 is configured to obtain information of the shared load that needs to be balanced sent by the requesting eNB 61 and prepare baseband resource based on the information of the shared load.

[0052] The requesting eNB 61 in this embodiment may be a load sharing device provided in the fourth embodiment of the present invention. The sharing eNB 62 in this embodiment may be a load sharing device provided in the fifth embodiment of the present invention.

[0053] It can be understood by those skilled in the art that all or some steps in the preceding embodiments of the present invention can be performed by instructing related hardware through a program. The program can be stored in a storage medium that can be read by a computer. When being executed, the program performs the steps in the preceding embodiments of the present invention. The storage medium may be ROM, RAM, disk, or CD that can store program codes.

[0054] Although various embodiments of the present invention have been described in detail above with reference to the drawings, the specific configuration thereof is not limited to the embodiments. Rather, it is intended that the following examples encompass any designs within the scope of the invention.

[0055] Further examples are:

1. A load sharing method includes:

obtaining a current load value of a requesting base station;
if the current load value of the requesting base station exceeds a preset load threshold value, selecting a sharing

base station from middle base stations that belong to a mobility management entity (MME) of the requesting base station;
 transmitting information of a shared load to the selected sharing base station; and
 sharing the shared load to the sharing base station according to baseband resource prepared based on the information of the shared load.

2. The method according to item 1, wherein, the process of selecting a sharing base station from middle base stations that belong to an MME of the requesting base station comprises:

sending a resource status request message to the middle base stations, wherein the resource status request message carries a shared load value;
 receiving a resource status response message from one or more middle base stations, wherein the resource status response message carries the current load value corresponding to the middle base station; and
 selecting at least one middle base station as the sharing base station based on the current load value corresponding to the middle base stations.

3. The method according to item 2, wherein, the resource status request message carries one or more of the following IDs: base station pool ID, operator ID, and service license ID.

4. The method according to item 1, wherein:

the process of transmitting information of a shared load to the selected sharing base station comprises: transmitting a resource reassign request message to the sharing base station, wherein the resource reassign request message carries the information of the shared load.

5. The method according to any one of items 1 to 4, wherein, the information of the shared load comprises context information of a user equipment (UE) corresponding to the shared load, and terminal ID in the MME.

6. The method according to item 5, wherein, the information of the shared load further comprises service ID of the shared load.

7. The method according to any one of items 2 to 4, wherein, the shared load value is an excessive load of the preset load threshold value, or depends on relevant information of a current service.

8. A load sharing method, includes:

receiving information of a shared load sent by a requesting base station; and
 preparing baseband resource based on the information of the shared load for the requesting base station to share the shared load to a sharing base station.

9. The method according to item 8, wherein:

the process of receiving information of the shared load sent by the requesting base station comprises:

receiving a resource reassign request message sent by the requesting base station, wherein the resource reassign request message carries the information of the shared load; and
 the process of preparing baseband resource based on the information of the shared load comprises:

performing baseband resource admission for the shared load requested to be shared in the resource reassign request message; and
 transmitting a path switch request message to the MME, wherein the path switch request message carries the information of the shared load for requesting to share the shared load.

10. The method according to item 8 or 9, wherein, the information of the shared load comprises context information of a UE corresponding to the shared load, and terminal ID in the MME.

11. The method according to item 10, wherein, the information of the shared load further comprises service ID of the shared load.

12. A load sharing device, includes:

a first obtaining unit, configured to obtain a current load value of a requesting base station;
 a selecting unit, configured to: if the current load value of the requesting base station exceeds a preset load threshold value, select a sharing base station from middle base stations that belong to a mobility management

entity (MME) of the requesting base station;
 a processing unit, configured to transmit information of a shared load to the selected sharing base station; and
 a sharing unit, configured to share the shared load to the sharing base station according to baseband resource
 prepared based on information of the shared load.

13. A load sharing device, includes:

a second obtaining unit, configured to receive information of a shared load sent by a requesting base station; and
 a preparing unit, configured to prepare baseband resource based on the information of the shared load for the
 requesting base station to share the shared load to a sharing base station.

14. A load sharing system, including a requesting base station and a sharing base station, wherein:

the requesting base station is configured to: obtain a current load value of the requesting base station;
 if the current load value exceeds a preset load threshold value, select the sharing base station from the middle
 base stations that belong to a mobility management entity (MME) of the requesting base station;
 transmit information of a shared load to the selected sharing base station; and share the shared load to the
 sharing base station according to the baseband resource prepared based on information of the shared load; and

the sharing base station is configured to receive the information of the shared load sent by the requesting base
 station and prepare the baseband resource based on the information of the shared load.

The preceding embodiments are intended to describe the technical scheme revealed in the present invention but
 not to confine the invention. It is understandable to those skilled in the art that modifications or equivalent replacements
 can be made on the technical scheme provided in embodiments of the present invention without departing from the
 spirit and scope of the technical scheme provided in the present invention.

Claims

1. A base station, when programmed for carrying out a method for sharing load, comprising:

means for obtaining (101, 301) a current load value of the base station;
 means for selecting (102, 304) a sharing base station from middle base stations that belong to a mobility
 management entity, MME, connected to the base station, if the current load value of the base station exceeds
 a preset load threshold value;
 means for transmitting (103, 305) information of a load to be shared to the selected sharing base station, for
 the load to be shared with the sharing base station without switching a user equipment, UE, to a cell served by
 the sharing base station; and
 means for sharing (104, 310) the load to be shared to the sharing base station according to baseband resource
 prepared based on the information of the load to be shared.

2. The base station according to claim 1, wherein the means for selecting is further configured to:

send a resource status request message to the middle base stations, wherein the resource status request
 message carries a load to be shared value;
 receive a resource status response message from one or more middle base stations, wherein the resource
 status response message carries the current load value of the middle base station; and
 select at least one middle base station as the sharing base station based on the current load value of the middle
 base stations.

3. The base station according to claim 2, wherein the resource status request message carries one or more of the
 following IDs:

base station pool ID, operator ID, and service license ID.

4. The base station according to any one of claims 1 to 3, wherein the means for transmitting is further configured to:

transmit a resource reassign request message to the sharing base station, wherein the resource reassign

request message carries the information of the load to be shared.

- 5 5. The base station according to any one of claims 1 to 4, wherein the information of the load to be shared comprises context information of the UE, corresponding to the load to be shared, and terminal ID in the MME.

6. A base station, when programmed for carrying out a method for sharing load, comprising:

10 means for receiving information of a load to be shared sent from a requesting base station, for the load to be shared with the base station without switching a user equipment, UE, in a cell served by the requesting base station to another cell served by the base station when a current load of the requesting base station exceeds a present load threshold; and

 means for preparing baseband resource based on the information of the load to be shared for the requesting base station to share the load to be shared with the base station.

- 15 7. The base station according to claim 6, wherein the means for receiving is further configured to:

 receive a resource reassign request message sent by the requesting base station, wherein the resource reassign request message carries the information of the load to be shared.

- 20 8. The base station according to claim 6 or 7, wherein the means for preparing is further configured to:

 perform baseband resource admission for the load to be shared requested to be shared in the resource reassign request message; and

25 transmit a path switch request message to a mobility management entity, MME, wherein the path switch request message carries the information of the load to be shared for requesting to share the load to be shared.

- 30 9. The base station according to any one of claims 6 to 8, wherein the information of the shared load comprises context information of the UE corresponding to the shared load, and terminal ID in the MME.

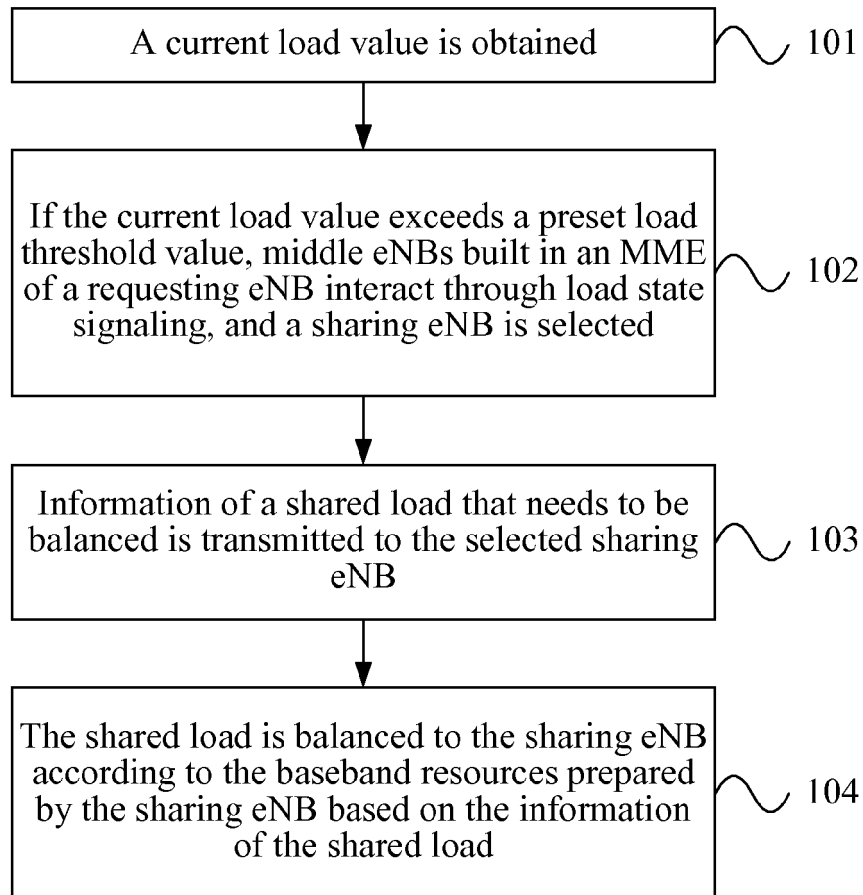


FIG. 1

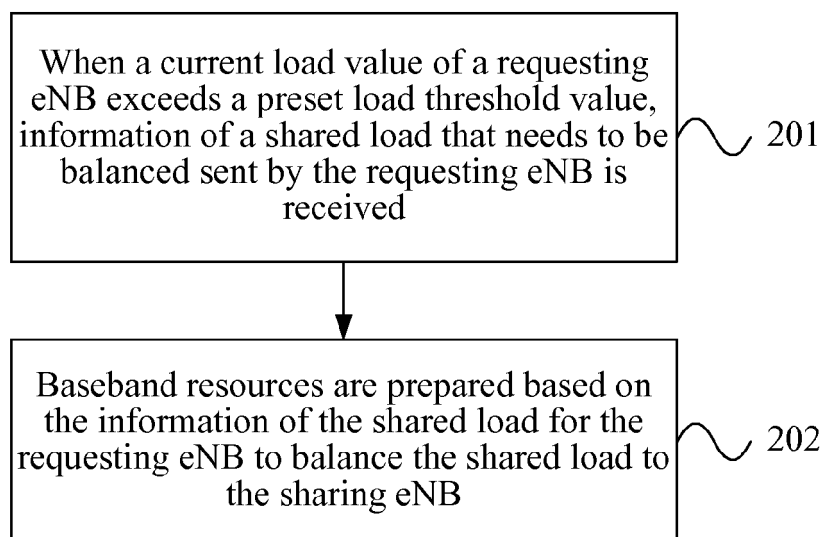


FIG. 2

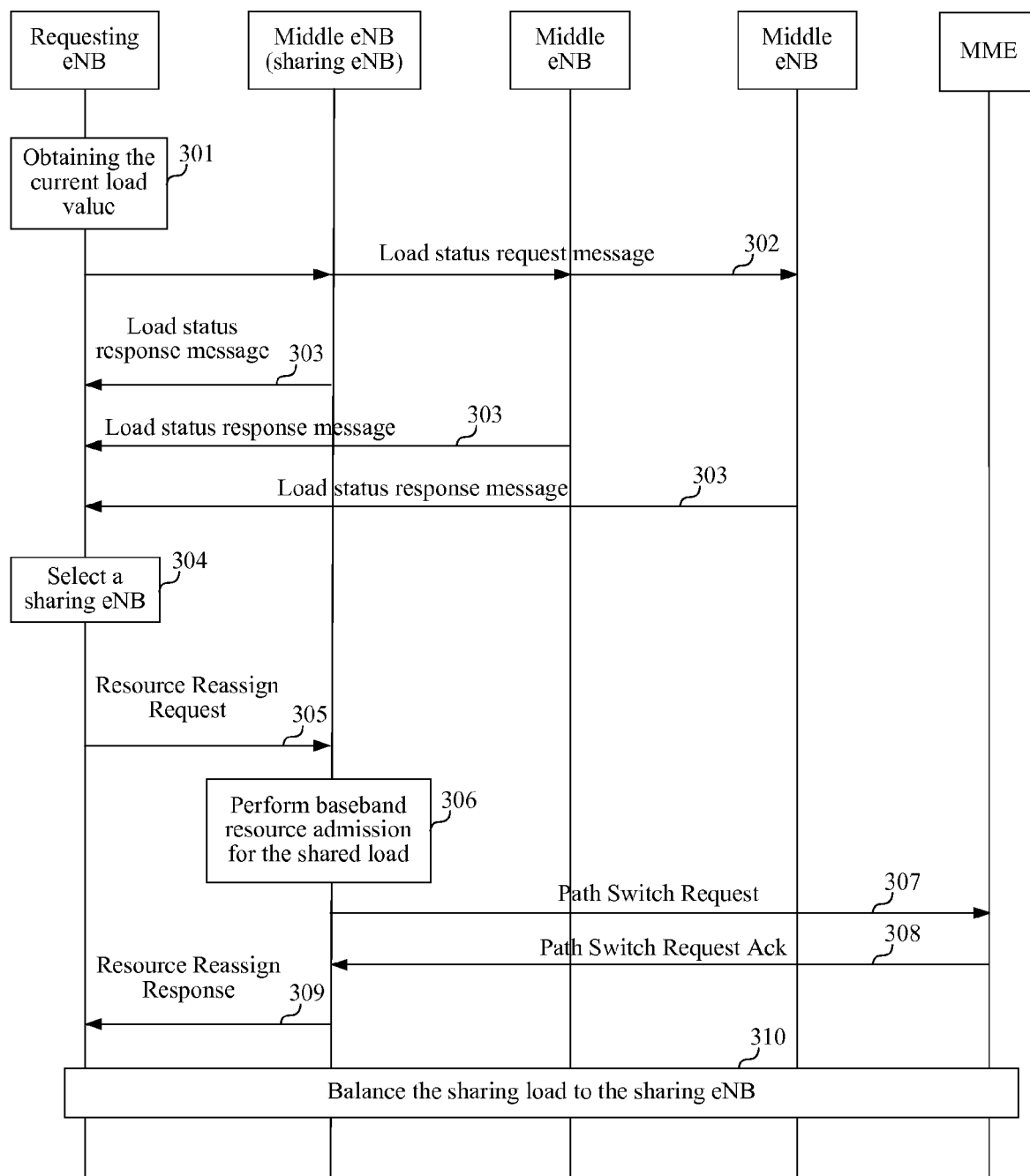


FIG. 3

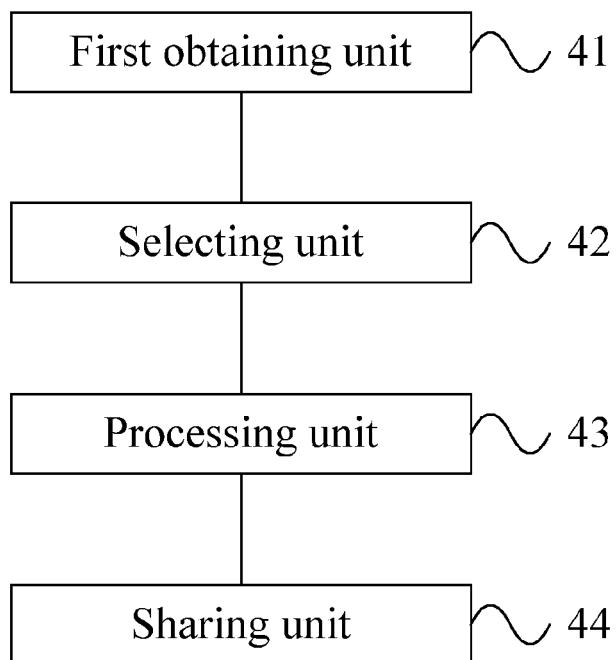


FIG. 4

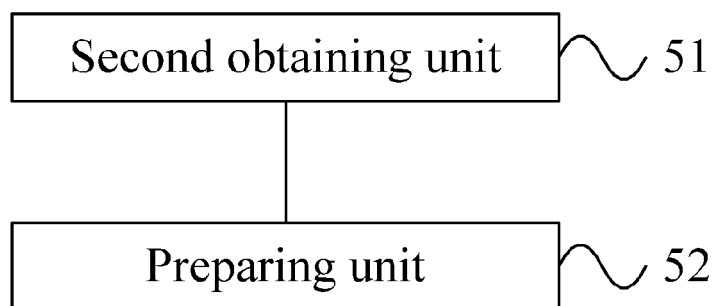


FIG. 5

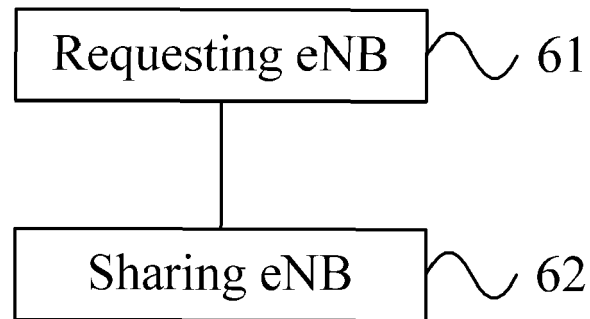


FIG. 6